The Availability of Low-Fat Milk in an Inner-City Latino Community: Implications for Nutrition Education

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ABSTRACT

Substitution of low-fat for whole milk is an important strategy for reducing saturated fat consumption, but intake of whole milk remains high among Latinos. To assess whether this is related to the unavailability of low-fat milk, we surveyed 251 grocery stores (*bodegas*) and 25 supermarkets in a predominantly low-income, urban Latino community. Low-fat milk was available in 73% of *bodegas* and 96% of supermarkets, but it constituted only 15% of total milk volume in *bodegas* and 37% of that volume in supermarkets. Since lack of availability was not a major obstacle to increasing low-fat milk consumption, public health nutrition campaigns should focus on increasing consumer demand. (*Am J Public Health.* 1995;85:1690–1692)

Introduction

The National Cholesterol Education Program[1,2] has recommended the substitution of low-fat for whole milk as an important strategy for achieving one of the key nutrition risk-reduction objectives for the nation: reducing total and saturated fat consumption.[3] Whole milk has been found to be the single largest source of saturated fat in the diets of children studied in a national sample[4] and in a low-income Latino sample.[5] Studies have shown that, relative to non-Latino Whites, Latinos are more likely to consume whole milk.[4,6–9] A national survey of US children aged 2 through 5 years found that 75% of total milk consumed by Latino children was whole milk, compared with 51% for White children.[4] A survey of US women aged 19 to 50 found that whole milk was the largest source of saturated fatty acids for Latino women, but was not among the top five sources of saturated fatty acids for White women.[6]

To our knowledge, no research has addressed the question of whether the continuing use of whole milk is related to the unavailability of low-fat milk, or whether low-fat milk is relatively available and differences across sociodemographic groups largely reflect variations in consumer preferences. We therefore measured low-fat milk availability in small grocery stores (*bodegas*) and supermarkets in a primarily low-income, inner-city Latino community. We also examined how both availability and the proportion on store shelves of all milk that was low fat were related to the geographic location of the *bodegas,* a proxy for the socioeconomic and demographic characteristics of customers.

Methods

Study Setting

Washington Heights–Inwood is a low-income, inner-city community in New York City with approximately 30% of its residents living below the poverty level.[10] Of the area's approximately 200 000 residents, 67% are Latino, 19% are White non-Latino, and 11% are Black non-Latino.[10] The majority of the community's Latinos are relatively recent immigrants from the Dominican Republic or the children of those immigrants.[11] The area west of Broadway, the community's most important north-south avenue, is almost equally populated by Whites and Latinos, while the ratio of Latinos to Whites is more than 7:1 east of Broadway. Compared with the population west of Broadway, the population east of Broadway is considerably younger and much more likely to be living below the poverty level.[10]

Bodegas were defined as food stores that sell milk (to distinguish them from candy stores, fruit stores, and meat markets) and have only one cash register (to distinguish them from supermarkets). A total of 257 *bodegas* were identified in the

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community by direct observation of every street in October 1991. Twenty-five supermarkets were identified in this area in September 1993.

Measurements

Bodega shelves were observed between October 1991 and June 1992 by three independent observers during one visit to each of 251 *bodegas*. Because five *bodega* managers refused to participate and one *bodega*'s records were lost, the response rate was 98%. Supermarket milk carton counts were conducted in September 1993 by one observer during one visit to each of 25 supermarkets. Observers counted the number of containers of four different types of milk (whole, 2% fat, 1% fat, and skim) in each of three different sizes (quarts, half-gallons, gallons). To assess interrater reliability of the shelf milk counts, two independent observers collected data simultaneously at 15 *bodegas*. These data indicated excellent consistency ($r > .99$, $P < .001$) for the proportion of shelf space occupied by low-fat (2% fat, 1% fat, and skim) milk. To assess test–retest reliability, one of the data collectors repeated the shelf observations 17 days after the initial observations at 14 of the 15 *bodegas* (one manager refused to participate). Low-fat milk availability was the same at all 14 stores, and repeated measures of the proportion of milk shelf space occupied by low-fat milk were highly correlated ($r = .92$, $P < .001$).

Data Analysis

Milk counts were aggregated into "total quarts" for each of the four types of milk by adding the total number of quarts, the total number of half-gallons multiplied by two, and the total number of gallons multiplied by four. The proportion of milk shelf space occupied by low-fat milk was summarized by the proportion of total quarts of all milk that was 2% fat, 1% fat, or skim. *Bodegas* were classified into three groups based on geographic location (east of, west of, or on Broadway), and chi-squared analyses were conducted to examine differences in the proportion of geographically aggregated *bodegas* selling each type of milk. Geographic differences in the mean proportion of milk shelf space occupied by low-fat milk were assessed using one-way analyses of variance.

Results

All of the 251 *bodegas* observed sold whole milk, and 73% (n = 183) sold low-fat milk. One percent low-fat milk was, by far, the most widely available type of low-fat milk: 70% (n = 175) of the 251 *bodegas* sold 1% low-fat milk, 30% (n = 74) sold skim milk, and 5% (n = 12) sold 2% low-fat milk. Low-fat milk was typically sold in quart and half-gallon containers but was difficult to find in gallon containers. While 94% (n = 237) of the *bodegas* sold gallons of whole milk, less than 20% (n = 49) sold gallons of 1% low-fat milk, only 3% (n = 7) sold gallons of 2% low-fat milk, and none sold gallons of skim milk. Low-fat milk comprised 15% of all the milk counted on all the *bodega* shelves and occupied a mean of 13% (median 9%) of the total *bodega* shelf space occupied by milk per *bodega*.

Twenty-four of the 25 supermarkets sold low-fat milk, and all 24 sold gallon containers of it. Most of the supermarkets sold all three types of low-fat milk: 96% (n = 24) sold 1% low-fat milk, 88% (n = 22) sold skim milk, and 84% (n = 21) sold 2% low-fat milk. Low-fat milk comprised 37% of all the milk counted on all the supermarket shelves and occupied a mean of 36% of the total milk shelf space per supermarket.

Bodegas west of Broadway were significantly more likely than those east of Broadway to stock each type of low-fat milk, with *bodegas* on Broadway intermediate. Almost 91% of the *bodegas* west of Broadway sold low-fat milk, compared with 67% of those east of Broadway (Table 1). Low-fat milk's share of milk shelf space in *bodegas* east of Broadway (11%; 95% confidence interval [CI] = 8.8, 12.4) was significantly lower than that in *bodegas* west of Broadway (23%; 95% CI = 14.5, 30.7).

TABLE 1—Proportion of All Observed *Bodegas* Selling Low-Fat Milk, by Type of Milk and Location (n = 251)

	West of Broadway, % (n = 22)	On Broadway, % (n = 54)	East of Broadway, % (n = 175)	Chi-Square Values
Any skim or low-fat milk	90.9	85.2	66.9	11.0***
Skim milk	59.1	33.3	24.6	11.7***
1% low-fat milk	86.4	83.3	63.4	10.9***
2% low-fat milk	13.6	9.3	2.3	8.6*

*$P < .05$; **$P < .01$; ***$P < .005$.

Discussion

National sales of low-fat and skim milk are more than 1.5 times greater than whole milk sales.[12] In contrast, the *bodegas* in the community studied had, on average, more than six times as much whole milk as low-fat milk on their shelves, and supermarkets had nearly twice as much whole milk as low-fat milk. Thus, the National Cholesterol Education Program recommendation to substitute low-fat for whole milk, which has been largely adopted by the nation as a whole, has not yet been adopted by this Latino community.

Our findings show that the predominance of whole milk on milk shelves is not owing to the unavailability of low-fat milk. In the areas where more residents are less educated, poorer, and Latino, low-fat milk was harder to find, but it was still available in more than two thirds of the *bodegas*. Some stores charged more for low-fat than for whole milk, but price differences were not related to the proportion of milk shelf space occupied by low-fat milk (data not presented). It is possible that demand for low-fat milk may be limited by the limited availability of low-fat milk in gallon containers, which are more economical than the smaller containers in which low-fat milk was typically sold. We believe, however, that whole milk dominates the market in the community studied primarily because of genuine consumer preferences for whole milk; such preferences stem in large part from a lack of knowledge about low-fat milk and from culturally shaped attitudes toward the fat content in milk.[13,14]

The key to promoting the substitution of low-fat for whole milk appears to be interventions that promote demand through strategies such as nutrition education and social marketing campaigns.[13] These campaigns could identify and address consumer misconceptions about the attributes of low-fat and whole milk; use consumer research findings to develop different marketing and communication

strategies for different subgroups; and use sales promotion techniques, such as discount coupons, point-of-purchase displays, free samples, prize giveaways, and contests, to motivate consumers to try low-fat milk.

Store shelf observations offer a reliable, low-cost method for assessing a community's nutritional environment and have been shown in one study to be related to reported consumption of low-fat food products by individuals living near the surveyed stores.[15] Proportional shelf space measurements, however, must be considered a fairly crude estimate of consumer preferences, sales, and consumption. The proportion of shelf space occupied by low-fat milk at any given store may vary considerably based on the time in the milk delivery cycle at which the measurement is made. Although our test–retest correlations were excellent, repeated measures may be desirable to ensure stable measures for individual stores.

Generalizability of study results may be limited since the Latino population of the United States is highly heterogenous. Further studies are needed to examine low-fat milk availability in other Latino communities; improve understanding of the knowledge, attitudes, and practices of Latino food buyers related to low-fat milk; and explore the sociocultural context in which nutrition innovations are made in Latino families. Public health nutrition programs that promote demand for low-fat milk in the Latino community warrant development and evaluation. □

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